

Claims

1. A rotatable feed wheel for a sheet converting machine, comprising:

5 (a) a hub including a rigid body having a cylindrical shape relative to an axis of rotation through said rigid body and an external peripheral surface about said rigid body; and

10 (b) a tread including a discontinuous annular body having a ring-shaped configuration and made of a resilient pliable stretchable deformable material, said annular body further having opposing leading and trailing ends with mateable female and male surfaces of complementary non-planar configurations defined respectively on said leading and trailing ends and forming a discontinuous non-planar join through said annular body such that said annular body  
15 can be fitted over and about, and also removed from, said rigid body of said hub by yieldably and resiliently deforming and stretching said annular body temporarily out of said ring-shaped configuration to and from a seated relationship of said annular body about and with said  
20 external peripheral surface of said rigid body of said hub and such that in said seated relationship an outer peripheral surface of said annular body is adapted to make a gripping contact with a surface of a sheet and to cause feeding of the sheet in a preselected direction when said  
25 annular body is moved in a given direction of rotation with the rotatable feed wheel about said axis of rotation;

30 (c) said hub and tread further including respective elements cooperating together so as to retain said annular body of said tread on and about said rigid body of said hub and prevent rotational movement of said tread relative to said hub and also to retain said non-planar mateable female and male surfaces interfitted with one another during rotation of said feed wheel.

2. The feed wheel of claim 1 wherein said non-planar

mateable female and male surfaces respectively on said leading and trailing ends of said annular body of said tread have complementary female and male zigzag configurations.

3. The feed wheel of claim 1 wherein said non-planar mateable female and male surfaces respectively on said leading and trailing ends of said annular body of said tread have complementary female and male V-shaped configurations.

4. The feed wheel of claim 1 wherein said respective cooperating elements of said hub are a plurality of holes defined in said rigid body and being open at said external peripheral surface thereof.

5. The feed wheel of claim 1 wherein each of the holes is of cylindrical configuration.

6. The feed wheel of claim 4 wherein said respective cooperating elements of said tread are a plurality of locking lugs formed on and protruding inwardly of said annular body, said locking lugs having configurations complementary to configurations of said holes of said hub so as to enable said locking lugs to fit into said holes.

7. The feed wheel of claim 6 wherein each of the locking lugs is of cylindrical configuration.

8. The feed wheel of claim 6 wherein said plurality of holes in said rigid body of said hub includes first and second holes disposed in a side-by-side closely spaced apart relation to one another and being reversely angularly displaced relative to one another away from respective first and second radial lines extending from said axis of rotation through said first and second holes of said rigid body.

9. The feed wheel of claim 8 wherein said plurality of locking lugs on said annular body of said tread includes first and second locking lugs respectively on said leading and trailing ends of said annular body and being reversely  
5 angularly displaced relative to one another away from said respective first and second radial lines extending from said axis of rotation through said first and second locking lugs of said annular body and adapted to insert into said first and second holes in said rigid body of said hub such  
10 that said reversely angularly displaced holes and locking lugs provide a fish hook effect at said leading and trailing ends of said tread anchoring said tread on said hub.

10. The feed wheel of claim 9 wherein said first and second holes in said rigid body of said hub are more angularly displaced relative to said radial lines than are said first and second locking lugs angularly displaced  
5 relative to said radial lines which causes stressing of said first and second locking lugs when said locking lugs are inserted into said first and second holes and thereby causes said leading and trailing ends of said annular body of said tread to be pulled together and inward toward said  
10 hub so as to maintain said non-planar mateable female and male surfaces respectively formed on said leading and trailing ends of said annular body interfitted and interlocked with one another.

11. The feed wheel of claim 8 wherein said plurality of holes in said rigid body of said hub also includes a third hole disposed opposite from said first and second holes.

12. The feed wheel of claim 11 wherein said plurality of locking lugs on said annular body of said tread also includes a third locking lug disposed on said annular body opposite from said first and second locking lugs and

5 adapted to insert into said third hole in said rigid body of said hub.

13. The feed wheel of claim 1 wherein said tread includes at least a recess circumferentially located about said tread and formed to a preselected depth in said outer peripheral surface of said tread to enable a user to make  
5 an assessment as to the amount of said material that has worn off said outer peripheral surface and thus an outside diameter of said tread.

14. A rotatable feed wheel for a sheet converting machine, comprising:

(a) a hub including a rigid body having a cylindrical shape relative to an axis of rotation through said rigid  
5 body, an external peripheral surface about said rigid body, and a plurality of holes defined in said rigid body and being open at said external peripheral surface thereof, said plurality of holes including first and second holes disposed in a side-by-side closely spaced apart relation to  
10 one another and being reversely angularly displaced relative to one another away from respective first and second radial lines extending from said axis of rotation through said first and second holes of said rigid body; and

(b) a tread including a discontinuous annular body  
15 having a ring-shaped configuration and made of a resilient pliable stretchable deformable material, said annular body further having opposing leading and trailing ends with mateable surfaces of complementary configurations defined respectively on said leading and trailing ends and forming  
20 a discontinuous join through said annular body such that said annular body can be fitted over and about, and also removed from, said rigid body of said hub by yieldably and resiliently deforming and stretching said annular body temporarily out of said ring-shaped configuration to and  
25 from a seated relationship of said annular body about and with said external peripheral surface of said rigid body of

said hub and such that in said seated relationship said annular body is adapted to make a gripping contact with a surface of a sheet and to cause feeding of the sheet in a preselected direction when said annular body is moved in a given direction of rotation with the rotatable feed wheel about said axis of rotation;

(c) said tread further including a plurality of locking lugs on said annular body having configurations complementary to configurations of said holes of said hub so as to enable said locking lugs to fit into said holes and retain said annular body of said tread on and about said rigid body of said hub so as to prevent rotational movement of said tread relative to said hub during rotation of said feed wheel and further enable said surfaces respectively on said leading and trailing ends of said annular body to contact one another and thereby retain said leading and trailing ends together, said plurality of locking lugs including first and second locking lugs respectively on said leading and trailing ends of said annular body and being reversely angularly displaced relative to one another away from said respective first and second radial lines extending from said axis of rotation through said first and second locking lugs of said annular body and adapted to insert into said first and second holes in said rigid body of said hub such that said reversely angularly displaced holes and locking lugs provide a fish hook effect at said leading and trailing ends of said tread anchoring said tread on said hub.

15. The feed wheel of claim 14 wherein said first and second holes in said rigid body of said hub are more angularly displaced relative to said radial lines than are said first and second locking lugs angularly displaced relative to said radial lines which causes stressing of said first and second locking lugs when said locking lugs are inserted into said first and second holes and thereby causes said leading and trailing ends of said annular body

of said tread to be pulled together and inward toward said  
10 hub so as to maintain contact between said mateable  
surfaces on said leading and trailing ends of said annular  
body.

16. The feed wheel of claim 14 wherein said plurality  
of holes in said rigid body of said hub also includes a  
third hole disposed opposite from said first and second  
holes.

17. The feed wheel of claim 16 wherein said plurality  
of locking lugs on said annular body of said tread also  
includes a third locking lug disposed on said annular body  
opposite from said first and second locking lugs and  
5 adapted to insert into said third hole in said rigid body  
of said hub.

18. The feed wheel of claim 17 wherein each of said  
holes and locking lugs is of cylindrical configuration.

19. The feed wheel of claim 14 wherein said tread  
includes at least a recess circumferentially located about  
said tread and formed to a preselected depth in said outer  
peripheral surface of said tread to enable a user to make  
5 an assessment as to the amount of said material that has  
worn off said outer peripheral surface and thus an outside  
diameter of said tread.

20. A tread for a rotatable feed wheel, comprising:

(a) a discontinuous annular body having a ring-shaped  
configuration and made of a resilient pliable stretchable  
deformable material, said annular body having cylindrical  
5 outer and inner peripheral surfaces spaced apart from one  
another and leading and trailing ends respectively with  
mateable female and male surfaces thereon of non-planar  
complementary configurations forming a discontinuous non-  
planar join through said annular body between said outer

10 and inner surfaces thereof such that said annular body can  
be fitted over and about, and also removed from, a hub of  
a feed wheel by yieldably and resiliently deforming and  
stretching said annular body temporarily out of said ring-  
shaped configuration to and from a seated relationship of  
15 said annular body at said inner peripheral surface thereof  
about and with an external peripheral surface of the hub  
and such that in said seated relationship said outer  
peripheral surface of said annular body is adapted to make  
a gripping contact with a surface of a sheet and to cause  
20 feeding of the sheet in a preselected direction when said  
annular body is moved in a given direction of rotation with  
the hub about a central axis of rotation thereof, said non-  
planar mateable female and male surfaces on said leading  
and trailing ends of said annular body being capable of  
25 interfitting with one another and thereby tending to  
interlock said leading and trailing ends together; and

(b) a plurality of elements formed on said annular  
body for retaining said annular body about the hub and  
prevent rotational movement of said annular body relative  
30 to the hub and also for retaining said non-planar mateable  
female and male surfaces interfitted with one another  
during rotation of the feed wheel.

21. The tread of claim 20 wherein said non-planar  
mateable female and male surfaces respectively on said  
leading and trailing ends of said annular body of said  
tread have complementary female and male zigzag  
5 configurations.

22. The tread of claim 20 wherein said non-planar  
mateable female and male surfaces respectively on said  
leading and trailing ends of said annular body of said  
tread have complementary female and male V-shaped  
5 configurations.

23. The tread of claim 20 wherein said annular body

includes a tread portion and a spline portion integrally connected to a bottom central region of said tread portion and projecting inwardly therefrom, said non-planar mateable female and male surfaces being defined on both said tread portion and spline portion of said annular body at said leading and trailing ends thereof.

24. A tread for a rotatable feed wheel, comprising:

(a) a tread including a discontinuous annular body having a ring-shaped configuration and made of a resilient pliable stretchable deformable material, said annular body further having opposing leading and trailing ends with mateable surfaces of complementary configurations defined respectively on said leading and trailing ends and forming a discontinuous join through said annular body such that said annular body can be fitted over and about, and also removed from, said rigid body of said hub by yieldably and resiliently deforming and stretching said annular body temporarily out of said ring-shaped configuration to and from a seated relationship of said annular body about and with said external peripheral surface of said rigid body of said hub and such that in said seated relationship said annular body is adapted to make a gripping contact with a surface of a sheet and to cause feeding of the sheet in a preselected direction when said annular body is moved in a given direction of rotation with the rotatable feed wheel about said axis of rotation; and

(b) a plurality of locking lugs formed on said annular body at said inner peripheral surface thereof and projecting inwardly therefrom, said locking lugs being adapted to fit into holes of a hub so as to retain said annular body on and about the hub and prevent rotational movement of said tread relative to the hub during rotation of the feed wheel and further enable said surfaces respectively on said leading and trailing ends of said annular body to contact one another and thereby retain said leading and trailing ends together, said plurality of



locking lugs including first and second locking lugs respectively on said leading and trailing ends of said annular body and being reversely angularly displaced relative to one another away from said respective first and second radial lines extending from said axis of rotation through said first and second locking lugs of said annular body and adapted to insert into first and second holes in the hub such that said reversely angularly displaced first and second locking lugs provide a fish hook effect at said leading and trailing ends of said annular body anchoring the annular body on the hub.

25. The tread of claim 24 wherein said plurality of locking lugs on said annular body also includes a third locking lug disposed on said annular body opposite from said first and second locking lugs and adapted to insert into a third hole in the hub.

26. The tread of claim 24 wherein each of said locking lugs is of cylindrical configuration.

27. A hub for a rotatable feed wheel, comprising:

(a) a rigid body having a cylindrical shape relative to a central axis of rotation through said rigid body;

(b) an external peripheral surface on and extending about said rigid body;

(c) first and second holes defined in said rigid body and being disposed in a side-by-side closely spaced apart relationship to one another and open at said external peripheral surface of said rigid body such that said first and second holes are reversely angularly displaced relative to one another away from respective first and second radial lines extending through said first and second holes from said central axis of rotation; and

(d) a third hole defined in said rigid body opposite from said first and second holes and open at said external peripheral surface of said rigid body.

28. The hub of claim 27 further comprising:

means for clamping said rigid body onto a rotatable shaft for undergoing rotation therewith about said central axis of rotation.

29. The hub of claim 27 wherein each hole in said rigid body of said hub has a cylindrical configuration.

30. The hub of claim 27 wherein said peripheral surface of said rigid body defines a pair of cylindrical shoulders extending about said rigid body and a cylindrical annular channel recessed into said rigid body from between  
5 said cylindrical shoulders such that said first and second holes intersect said cylindrical shoulders and annular channel of said external peripheral surface on said first sector of said rigid body and said third hole intersects  
10 said cylindrical shoulders and annular channel of said external peripheral surface on said second sector of said rigid body.